PATENT

Atty Docket No.: 10014315-1
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IN THE CLAIMS:

Please find below a listing of all of the pending claims. The statuses of the claims are set forth in parentheses.

1. (Currently amended) A method for identifying music, comprising the steps of:

(a) recording a sample of audio data of the music to be identified;

(b) deriving a processed sample time signal from the audio data by filtering and downsampling the sample of audio data ~~with an A/D converter~~;

(c) sorting a plurality of songs, wherein each song is represented by a processed time signal, said processed time signals comprising time signals that have been processed through filtering and downsampling;

and

(d) matching the processed sample time signal with the processed time signal of a song in the plurality of songs.

2. (Currently amended) The method of claim 1, where the sorting step further comprises:

generating a sample feature vector for the processed sample time signal;

generating a feature vector for each processed time signal of the songs; and

sorting the songs in an ascending order based on feature space distance between the sample feature vector and respective feature vectors for each processed time signal of the songs.

3. (Currently amended) The method of claim 2, where the generating steps further comprise extracting features from the processed sample time signal and the processed time signals of the songs.

4. (Original) The method of claim 3, where the features comprise beat, noise, tone, pitch, loudness and tempo.

5. (Currently amended) The method of claim 1, where the sorting step further comprises:

generating a sample feature vector for the processed sample time signal;

generating a plurality of feature vectors for one or more processed time signals of the songs, wherein each feature vector of the plurality of feature vectors for a processed time signal is generated from a different segment of the song corresponding to the processed time signal;

separating the plurality of feature vectors for each processed time signal as distinct entries; and

sorting the entries in an ascending order based on feature space distance between the sample feature vector and respective feature vectors for the entries.

6. (Currently amended) The method of claim 2, where the matching step further comprises:

comparing the processed sample time signal to a first processed time signal in the ascending order;

computing a signal match waveform for the first time signal in relation to the processed sample time signal;

playing the song corresponding to the first processed time signal if the signal match waveform satisfies a decision rule;

indicating by a user whether the played song matches the sample of audio data; and

presenting to the user song information corresponding to the first processed time signal if the user indicates a match.

7. (Currently amended) The method of claim 6, where the signal match waveform is computed by calculating a cross-correlation of the first processed time signal in relation to the processed sample time signal.

8. (Currently amended) The method of claim 7, where the decision rule is satisfied if an overall absolute maximum of the cross-correlation computed for the first processed time signal is greater than an average cross-correlation by a predetermined factor.

9. (Currently amended) The method of claim 7, where the decision rule is satisfied if an overall absolute maximum of the cross-correlation computed for the first processed time signal is greater than an average cross-correlation by a predetermined factor, and no incorrect songs have been presented to the user.

10. (Original) The method of claim 6, where the song information comprises song title, artist and performance.

11. (Currently amended) The method of claim 6, further comprising, after the computing step, the step of:

comparing the processed sample time signal to a next processed time signal in the ascending order, and subsequently repeating the computing step with respect to the next processed time signal, if the signal match waveform does not satisfy the decision rule for the first processed time signal.

12. (Currently amended) The method of claim 6, further comprising the step of:

comparing the processed sample time signal to a next time signal in the ascending order, and subsequently repeating the computing, playing, indicating and presenting steps with respect to the next processed time signal, if the user indicates that the played song does not match the sample of audio data.

13. (Currently amended) A system for identifying music, comprising:

a means for recording a sample of audio data of the music to be identified;

a means for deriving a processed sample time signal from the audio data, said means for deriving being configured to filter and downsample the sample of audio data ~~with an A/D converter~~;

a means for sorting a plurality of songs, wherein each song is represented by a processed time signal, and wherein the processed time signals comprise time signals that have been processed through filtering and downsampling; and

a means for matching the processed sample time signal with the processed time signal of a song in the plurality of songs.

14. (Currently amended) The system of claim 13, where the means for sorting further comprises:

a means for generating a sample feature vector for the processed sample time signal;

a means for generating a feature vector for each processed time signal of the songs; and

a means for sorting the songs in an ascending order based on feature space distance between the sample feature vector and respective feature vectors for each processed time signal of the songs.

15. (Currently amended) The system of claim 14, where the means for generating a sample feature vector and the means for generating a feature vector for each time signal of the songs further comprise a means for extracting features from the processed sample time signal and the processed time signals of the songs.

16. (Original) The system of claim 15, where the features comprise beat, noise, tone, pitch, loudness and tempo.

17. (Currently amended) The system of claim 13, where the means for sorting further comprises:

a means for generating a sample feature vector for the processed sample time signal;

a means for generating a plurality of feature vectors for one or more processed time signals of the songs, wherein each feature vector of the plurality of feature vectors for a

processed time signal is generated from a different segment of the song corresponding to the processed time signal;

a means for separating the plurality of feature vectors for each processed time signal as distinct entries; and

a means for sorting the entries in an ascending order based on feature space distance between the sample feature vector and respective feature vectors for the entries.

18. (Currently amended) The system of claim 14, where the means for matching further comprises:

a means for comparing the processed sample time signal to a first processed time signal in the ascending order;

a means for computing a signal match waveform for the first processed time signal in relation to the processed sample time signal;

a means for playing the song corresponding to the first processed time signal if the signal match waveform satisfies a decision rule;

a means for indicating by a user whether the played song matches the sample of audio data; and

a means for presenting to the user song information corresponding to the first processed time signal if the user indicates a match.

19. (Currently amended) The system of claim 18, where the signal match waveform is computed by calculating a cross-correlation of the first processed time signal in relation to the processed sample time signal.

20. (Currently amended) The system of claim 19, where the decision rule is satisfied if an overall absolute maximum of the cross-correlation computed for the first processed time signal is greater than an average cross-correlation by a predetermined factor.

21. (Currently amended) The system of claim 19, where the decision rule is satisfied if an overall absolute maximum of the cross-correlation computed for the first processed time signal is greater than an average cross-correlation by a predetermined factor, and no incorrect songs have been presented to the user.

22. (Original) The system of claim 18, where the song information comprises song title, artist and performance.

23. (Currently amended) A method for identifying music, comprising the steps of:

(a) recording a sample of audio data of the music to be identified;

(b) deriving a processed sample time signal from the audio data by filtering and downsampling the sample of audio data ~~with an A/D converter~~; and

(c) matching the processed sample time signal with a processed time signal of the plurality of processed time signals in a database, wherein each of the plurality of processed times signals represents a song in the database, and wherein each of the processed time signals comprise time signals that have been processed through filtering and downsampling.

24. (Currently amended) The method of claim 23, where the matching step further comprises:

computing a signal match intensity for the plurality of processed time signals in the database in relation to the processed sample time signal;

selecting a processed time signal of the plurality of processed time signals having a maximum signal match intensity; and

presenting to a user song information corresponding to the selected processed time signal.

25. (Original) The method of claim 24, where the song information comprises song title, artist and performance.

26. (Currently amended) A system for identifying music, comprising:

a means for recording a sample of audio data of the music to be identified;

a means for deriving a processed sample time signal from the audio data, wherein said means for deriving is configured to filter and downsample the sample of audio data ~~with an A/D converter~~; and

a means for matching the processed sample time signal with a processed time signal of the plurality of processed time signals in a database, wherein each of the plurality of processed time signals represents a song in the database, and wherein each of the plurality of processed time signals comprise time signals that have been processed through filtering and downsampling.

27. (Currently amended) The system of claim 26, where the means for matching further comprises:

a means for computing a signal match intensity for the plurality of processed time signals in the database in relation to the processed sample time signal;

a means for selecting a processed time signal of the plurality of processed time signals having a maximum signal match intensity; and

a means for presenting to a user song information corresponding to the selected processed time signal.

28. (Original) The method of claim 27, where the song information comprises song title, artist and performance.

29. (Currently amended) A method for identifying music, comprising the steps of:

(a) recording a sample of audio data of the music to be identified;

(b) generating a first plurality of processed time signals from the sample of audio ~~data with an A/D converter~~, wherein the first plurality of processed time signals are generated in distinct frequency bands;

(c) generating a second plurality of processed time signals from songs in a data base, wherein the second plurality of processed time signals are generated in the same distinct frequency bands as the first plurality of time signals; and

(d) matching the first plurality of processed time signals with the second plurality of processed time signals.